flows in a counterclockwise direction 46 in the measurement loop 26. Similarly, current caused by voltage source 344 in the noise cancellation loop 32 flows in a counterclockwise direction, indicated by arrow 46. The noise cancellation loop 32 is connected to an inverting input 62 of an amplifier 64. An output 66 of amplifier 64 is connected through a summing resistor 70 to the inverting input 51 of amplifier 342. A feedback resistor 68 is connected between the inverting input 62 and the output 66 of amplifier 64. Feedback resistor 68 is preferably sized to set the gain of amplifier 64 in a conventional manner using the ration of the resistance of resistor 68 to the resistance of resistor 38 (assuming the impedance of source 344 is negligible). Summing resistor 70 is preferably selected to make the steady state output of the noise cancellation loop 32 equal to that of measurement loop 26.

REMARKS

Claims 1-23 are pending.

The specification has been amended to correct for an obvious typographical error on page 6. Support for the amendment to the specification can be found in the application as originally filed as well as in the Figure 9.

No new matter has been added.

Attached hereto is a marked up version of the changes made to the specification by the current amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

Response to Rejections

Claim rejections under 35 USC 102(b)

Claims 1, 10-13, 15-18 and 20 have been rejected under 35 U.S.C. 102(b) as being anticipated by Harman.

The present invention is directed to a biosensor cell assembly comprising a substrate, a measuring loop and a noise cancellation loop, wherein the noise cancellation loop is physically arranged to be exposed to substantially the same electromagnetic environment as the measuring loop and electrically connected to substantially cancel the

effect of **electr magnetically propagated field energy** irradiating the biosensor cell assembly.

Harman teaches a noise reduction technique for electrochemical sensors. Harman's sensor consists of a counter electrode, a sensing electrode, and a compensating electrode. The sensing electrode is biased to the concentration polarization potential of the sought-after substance to cause current flow between the sensing electrode and the counter electrode (an equivalent of a measuring loop; page 19, claim 1). The compensating electrode is biased to a different potential sufficiently low to cause current flow between the counter electrode and the compensating electrode (an equivalent of a noise cancellation loop) due to **non-Faradaic phenomena and/or other electrochemically reactive substances**. The residual current due to non-Faradaic phenomena are defined as double layer capacitance charging currents and transient currents coupled into the amplifier through the sensor (page 3, line 22). Circuitry is provided for subtracting the compensating electrode signal output from the sensing electrode signal output and the difference is a signal which represents the diffusion current flow due to the electrochemical reaction of the sought-after substance.

Harman's sensor differs from the present invention as follows.

(1) Harman's assembly contains only 3 electrodes.

(2) Harman's measurement loop and noise cancellation loop are physically overlapped because they share one common electrode (i.e., counter electrode).

(3) Harman's loops are physically arranged to be electrically connected **through the electrolyte** (page 5, line 5) for the purpose of canceling noise current due to **non-Faradaic phenomena and/or other electrochemically reactive substances** .

Thus, the measurement loop and noise cancellation loop of Harman's are not physically arranged in such a manner as to enable its noise cancellation loop to substantially cancel the effect of **electr magnetically propagated field energy**

irradiating the biosensor cell assembly. Therefore, Harman's apparatus cannot anticipate the present invention, which requires a noise cancellation loop to be physically arranged to substantially cancel the effect of electromagnetically propagated field energy irradiating the biosensor cell assembly.

Claim rejections under 35 USC 103

Claims 1-23 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Parks in view of Harman.

The present invention is directed to a biosensor cell assembly comprising a substrate, a measuring loop and a noise cancellation loop, wherein the noise cancellation loop is physically arranged to be exposed to substantially the same electromagnetic environment as the measuring loop and electrically connected to substantially cancel the effect of **electromagnetically propagated field energy** irradiating the biosensor cell assembly.

Parks teaches a biosensor device which has two electrodes forming a measurement loop that includes a test cell on a substrate. Parks does not teach a noise cancellation loop to cancel effect of **electromagnetically propagated field energy** irradiating the biosensor cell assembly.

Harman, the secondary reference, fails to remedy the deficiencies of Parks. As described in the previous paragraph, Harman teaches a noise cancellation loop to reduce background current due to non-Faradaic phenomena and/or other electrochemically reactive substances. Harman fails to teach or suggest electromagnetically propagated field energy, let alone a noise cancellation loop to substantially cancel the effect of the **electromagnetically propagated field energy** irradiating a biosensor cell assembly.

Harman fails to teach or suggest, provide any motivation or an expectation of success so that one of skill in the art would utilize any of the noise cancellation loops,

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described throughout the application, in a biosensor cell assembly to substantially cancel the effect of **electr magnetically propagated field energy** irradiating the biosensor cell assembly.

Neither reference, alone or in combination teaches or suggests, provides any motivation or an expectation of success so that one of ordinary skill in the art would utilize any of the noise cancellation loops, described throughout the application, in a biosensor cell assembly capable of substantially canceling the effect of **electromagnetically propagated field energy** irradiating the biosensor cell assembly.
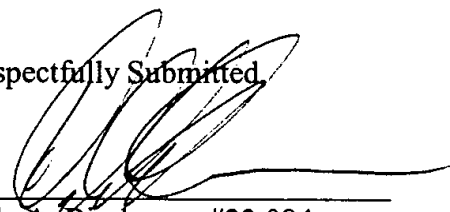
Therefore, claims 1-23 are in allowable form. Reconsideration and withdrawal of the pending rejection is respectfully requested.

CONCLUSION

In view of the above remarks, it is respectfully submitted that the claims and the present application are now in condition for allowance. Approval of the application and allowance of the claims is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any remaining issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

Respectfully Submitted,

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Dated: June 28, 2002

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Referring now to Figure 9, and alternative (simplified) schematic 340 for the biosensing cell assembly 330, power source 344 and amplifier 342 may be seen. In this embodiment it is to be understood that the response current caused by voltage source 344 flows in a counterclockwise direction 46 in the measurement loop 26. Similarly, current caused by voltage source 344 in the noise cancellation loop 32 flows in a counterclockwise direction, indicated by arrow 46. The noise cancellation loop 32 is connected to an inverting input 62 of an amplifier 64. An output 66 of amplifier 64 is connected through a summing resistor 70 to the inverting input 51 of amplifier 342. A feedback resistor 68 is connected between the inverting input 62 and the output 66 of amplifier 64. Feedback resistor 68 is preferably sized to set the gain of amplifier 64 [66] in a conventional manner using the ration of the resistance of resistor 68 to the resistance of resistor 38 (assuming the impedance of source 344 is negligible). Summing resistor 70 is preferably selected to make the steady state output of the noise cancellation loop 32 equal to that of measurement loop 26.